

**REMARKS**

Claims 1-26 and 28-63 are pending in the application. Claims 1-26 and 28-63 stand rejected. Claims 8-12, 14, 21, 29, 39-43, 45, 52, and 62-63 are being amended. Claims 8-12, 14, 21, 29, 39-43, 45, 52, and 62-63 are being cancelled. Claims 64-73 are being added. No new matter is believed introduced by way of the amendments and the new claim.

**Rejections Under 35 U.S.C. §101**

Claims 32-61 were rejected under 35 U.S.C. §101 for being directed to non-statutory subject matter. Specifically, independent Claims 32 and 57 and their associated dependent claims fail to be tied to a particular machine or apparatus or transform underlying subject matter to a different state or thing.

Claims 32 and 57 are being amended to clarify that the claimed methods transform a near-end signal into a modified near-end signal with reduced echo, and these claims are tied to a particular apparatus, namely a communication system. Support for this amendment may be found on in the Application as originally filed at least on page 15, lines 24-26 and in Figs. 9 and 10. Accordingly, Applicants respectfully submit that the rejection under 35 U.S.C. §101 is overcome.

Claims 39-43, 45, and 52 are now cancelled. Claims 33-38, 44, 46-51, 53-56, and 58-61 depend from independent Claims 32 and 57; therefore, Applicants respectfully submit that these dependent claims overcome the rejections for at least the same reasons as the base claims from which they respectively depend.

**Rejections Under 35 U.S.C. §102(e)**

Claims 1-4, 7, 12, 15-16, 18-19, 21-22, 32-35, 38, 43, 47, 50, 52-53, and 62 were rejected under 35 U.S.C. §102(e) as being unpatentable over Rabipour *et al.* (U.S. Patent Number 6,011,846), hereinafter referenced as "Rabipour."

Claim 1 is now amended. Support for this amendment may be found in the specification as originally filed at least on page 19, line 4 through page 21, line 14 and also in reference to Applicants' Figs. 12 and 13.

Claim 1 as amended in the Claim Listing above recites:

An apparatus for reducing echo in a near-end signal in a communication system including near-end and far-end signals, the near-end signal including a plurality of parameters, the apparatus comprising:

an echo likelihood estimation module to generate an echo likelihood estimate representative of a likelihood of an echo signal in a partially decoded near-end signal as a function of a ratio of a power of a present subframe of the near-end signal and power of past values of far-end subframes in a buffer;

an echo reduction module to reduce echo in the near-end signal as a function of replacing at least a first parameter of the plurality of parameters with an adjusted first parameter responsive to the echo likelihood estimate; and

a transmitter to transmit the near-end signal with reduced echo.

In particular, Claim 1 recites **“an echo likelihood estimation module to generate an echo likelihood estimate representative of a likelihood of an echo signal in a partially decoded near-end signal as a function of a ratio of a power of a present subframe of the near-end signal and power of past values of far-end subframes in a buffer”** (emphasis added).

In contrast to Claim 1, Rabipour merely employs echo suppression to make a decision regarding the adjustment of parameters of a frame by estimating the energy of echo based on comparing the energy within a spectrum. Specifically, Rabipour calculates the variances of near-end and far-end spectra for the current frame (see Fig. 3) and compares their covariance against a predetermined threshold to declare an echo or a no-echo condition with certainty (column 5 line 29 – column 6, line 11). If sufficient echo is detected, Rabipour adjusts the parameters of the frame. In the no-echo case, Rabipour allows the parameters to pass without any modification.

Page 3 of the present Office Action states that Rabipour anticipates Applicants’ claimed echo likelihood calculation because it relies on a function of a ratio of an average signal energy over time of near-end and far-end signals to determine the likely degree of an echo in order to allow his system to choose the proper course of action in eliminating/lessening the distorting echo. Applicants respectfully disagree. Specifically, as acknowledged by the Office Action, Rabipour merely employs a ratio of far-end and near-end energies to determine the most effective echo suppression treatment. Determining the most effective echo suppression treatment is clearly different from Applicants’ determining of “a likelihood of an echo signal in a partially decoded near-end signal.” Simply stated, Applicants’ Claim 1 determines “a likelihood of an

echo signal,” whereas Rabipour determines, with certainty, the most effective echo suppression treatment.

Thus, Rabipour merely obtains the cross-covariance of the near-end signal and far-end spectra and compares the obtained value against a predetermined threshold to declare echo with certainty. Rabipour does not “generate an echo likelihood estimate representative of a likelihood of an echo signal in a partially decoded near-end signal as a function of a ratio of a power of a present subframe of the near-end signal and power of past values of far-end subframes in a buffer,” as required by Applicants’ Claim 1.

In view of the foregoing, Applicants respectfully submit that Claim 1 as now amended overcomes the rejection under 35 U.S.C. §102(e).

Independent Claims 32 and 62 are being amended to include similar elements as now amended Claim 1 and should be allowed for similar reasons.

Claims 12, 43, and 52 are now cancelled. Dependent Claims 2-4, 7, 15-16, 18-19, and 21-22 depend from amended claim 1, and Claims 32-35, 38, 47, 50, and 53-53 depend from amended claim 32. Accordingly, Applicants respectfully submit that these claims should be allowed for at least the same reasons as the base claims from which they depend.

#### **Rejections Under 35 U.S.C. §103(a)**

Claims 5-6, 13-14, and 36-37 were rejected under 35 U.S.C. §103(a) as being unpatentable over Rabipour in view of Strawczynski *et al.* (U.S. Patent Number 6,138,022), hereinafter referenced as “Strawczynski.”

Claim 14 is now cancelled. The remaining rejected Claims, Claims 5-6, 13, and 36-37 depend from amended Claims 1 or 32. However, as explained in the previous section, Rabipour does not teach all of the elements recited in now amended base Claims 1 and 32, namely, “generat[ing] an echo likelihood estimate representative of a likelihood of an echo signal in a partially decoded near-end signal as a function of a ratio of a power of a present subframe of the near-end signal and power of past values of far-end subframes in a buffer.” The shortcomings of Rabipour as presented above are not cured by Strawczynski, which is said to be combined with Rabipour only for its use of log area coefficients. Therefore, it is Applicants’ position that these claims are allowable over Rabipour in view of Strawczynski.

Accordingly, Applicants respectfully request that the rejections under 35 U.S.C. § 103(a) of Claims 5-6, 13, and 36-37 be withdrawn.

Claims 8-9 and 39-40 were rejected under 35 U.S.C. §103(a) as being unpatentable over Rabipour in view of Gritton *et al.* (U.S. Patent Number 5,857,167), hereinafter referenced as “Gritton.” Claims 8-9 and 39-40 are now cancelled. Amended Claims 4 and 35 now include the subject matter recited in Claims 8-9 and 39-40.

Regarding the Gritton reference, Applicants note that this reference is said to be combined with Rabipour only because it employs codebook gain, as required by Claims 4 and 35. As explained in the previous section, Rabipour does not teach all of the elements recited in now amended base Claims 1 and 32, namely, “generat[ing] an echo likelihood estimate representative of a likelihood of an echo signal in a partially decoded near-end signal as a function of a ratio of a power of a present subframe of the near-end signal and power of past values of far-end subframes in a buffer.” The shortcomings of Rabipour as presented above are not cured by Gritton, which is said to be combined with Rabipour only for its use of codebook gain. Therefore, it is Applicants’ position that amended Claims 4 and 25 are allowable over Rabipour in view of Gritton.

Claims 10-11, 20, 23-25, 41, 42, 46, 49, 51 and 54-46 were rejected under 35 U.S.C. §103(a) as being unpatentable over Rabipour in view of Chen *et al.* (U.S. Patent Number 5,651,091), hereinafter referenced as “Chen.”

Claims 10-11 and 41-42 are now cancelled. The remaining rejected Claims, Claims 20, 23-25, 46, 49, 51 and 54-46 depend from amended Claims 1 or 32. However, as explained in the previous section, Rabipour does not teach all of the elements recited in now amended base Claims 1 and 32, namely, “generat[ing] an echo likelihood estimate representative of a likelihood of an echo signal in a partially decoded near-end signal as a function of a ratio of a power of a present subframe of the near-end signal and power of past values of far-end subframes in a buffer.” The shortcomings of Rabipour as presented above are not cured by Chen, which is said to be combined with Rabipour only for its use of long-term predictor coding, long-term pitch predictor, and subframe based processing. Therefore, it is Applicants’ position that these claims are allowable over Rabipour in view of Chen.

Accordingly, Applicants respectfully request that the rejections under 35 U.S.C. § 103(a) of Claims 20, 23-25, 46, 49, 51 and 54-46 be withdrawn.

Claim 17 was rejected under 35 U.S.C. §103(a) as being unpatentable over Rabipour in view of Christensson *et al.* (U.S. Patent Number 6,510,224), hereinafter referenced as “Christensson.”

Claim 17 depends from amended Claim 1. However, as explained in the previous section, Rabipour does not teach all of the elements recited in now amended base Claim 1, namely, “generat[ing] an echo likelihood estimate representative of a likelihood of an echo signal in a partially decoded near-end signal as a function of a ratio of a power of a present subframe of the near-end signal and power of past values of far-end subframes in a buffer.” The shortcomings of Rabipour as presented above are not cured by Christensson, which is said to be combined with Rabipour only for its use of power parameters. Therefore, it is Applicants’ position that this claim is allowable over Rabipour in view of Christensson.

Accordingly, Applicants respectfully request that the rejections under 35 U.S.C. § 103(a) of Claim 17 be withdrawn.

Claims 26, 28-31, and 57-61 were rejected under 35 U.S.C. §103(a) as being unpatentable over Rabipour in view of Applicants’ Admitted Prior Art, hereinafter referenced as “AAPA.”

Claims 26 and 57 are being amended to include similar elements as independent Claim 1. As explained in the previous section, Rabipour does not teach all of the elements recited in now amended base Claims 26 and 57, namely, “generat[ing] an echo likelihood estimate representative of a likelihood of an echo signal in a partially decoded near-end signal as a function of a ratio of a power of a present subframe of the near-end signal and power of past values of far-end subframes in a buffer.” The shortcomings of Rabipour as presented above are not cured by AAPA, which is said to be combined with Rabipour only for its use of the TFO GSM standard. Therefore, it is Applicants’ position that these claims are allowable over Rabipour in view of AAPA.

Accordingly, Applicants respectfully request that the rejections under 35 U.S.C. § 103(a) of Claims 26 and 57 be withdrawn.

Dependent Claims 28-31 and 58-61 depend from amended claims 26 and 57.

Accordingly, Applicants respectfully submit that these claims should be allowed for at least the same reasons as the base claims from which they depend.

Claims 44-45 were rejected under 35 U.S.C. §103(a) as being unpatentable over Rabipour in view of Chen and further in view of Strawczynski.

Claim 45 is now cancelled. Claim 44 is amended to include the elements previously recited in Claim 44.

Claim 44 depends from amended Claim 32. However, as explained in the previous section, Rabipour does not teach all of the elements recited in now amended base Claim 32. The shortcomings of Rabipour as presented above are not cured by Strawczynski, which is said to be combined with Rabipour only for its use of LAR and LSF coefficients. Therefore, it is Applicants' position that this claim is allowable over Rabipour in view of Strawczynski.

Accordingly, Applicants respectfully request that the rejections under 35 U.S.C. § 103(a) of Claim 44 be withdrawn.

Claim 48 was rejected under 35 U.S.C. §103(a) as being unpatentable over Rabipour in view of Chen and further in view of Christensson.

Claim 48 depends from amended Claim 32. However, as explained in the previous section, Rabipour does not teach all of the elements recited in now amended base Claim 32. The shortcomings of Rabipour as presented above are not cured by Christensson, which is said to be combined with Rabipour only for its use of power parameters. Therefore, it is Applicants' position that this claim is allowable over Rabipour in view of Christensson.

Accordingly, Applicants respectfully request that the rejections under 35 U.S.C. § 103(a) of Claim 44 be withdrawn.

#### **Supplemental Information Disclosure Statement**

A Supplemental Information Disclosure Statement (SIDS) is being filed concurrently herewith. Entry of the IDS is respectfully requested.

**CONCLUSION**

In view of the above amendments and remarks, it is believed that all claims that will be pending after the entry of this amendment, Claims 1-7, 13, 15-20, 22-26, 28-38, 44, 46-51, 53-61, and 64-73 are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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